

WHAT IS CLAIMED IS

1. A single carrier/DS-CDMA packet
transmission method that expands a bandwidth of
5 information symbols by a sequence of spreading codes,
and transmits packets by use of spreading signals
having an expanded bandwidth, comprising:
assigning a predetermined time slot to
reservation demand packet transmission; and
10 time-multiplexing and transmitting
reservation demand packets and data packets, with
respect to part or all of the spreading codes.
2. A single carrier/DS-CDMA packet
15 transmission method that expands a bandwidth of
information symbols by a sequence of spreading codes,
and transmits packets by use of spreading signals
having an expanded bandwidth, comprising:
assigning k ($0 < k < n$) spreading codes of all
20 N spreading codes to reservation demand packet
transmission, and
time-multiplexing and transmitting
reservation demand packets and data packets.
- 25 3. The packet transmission method as
claimed in claim 1 or 2, wherein reservation demand
packet transmission admission probability determined
in advance is lowered when a channel occupancy rate
of the data packets exceeds a predetermined value.
- 30 4. The packet transmission method as
claimed in claim 2, wherein the spreading codes
assigned to the reservation demand packet

00926257 010402

transmission are decreased in number, and the spreading codes assigned to data-packet transmission are increased in number when a channel occupancy rate of the data packets exceeds a predetermined value.

5. The packet transmission method as claimed in claim 2, wherein the reservation demand packet transmission admission probability determined in advance is lowered first when a channel occupancy rate of the data packets exceeds a predetermined value, and, subsequently, the spreading codes assigned to the reservation demand packet transmission are decreased in number while the spreading codes assigned to data-packet transmission are increased in number when the channel occupancy rate of the data packets still exceeds the predetermined value even after the reservation demand packet transmission admission probability is lowered.

6. The packet transmission method as claimed in claim 2, wherein the spreading codes assigned to the reservation demand packet transmission are decreased in number first when a channel occupancy rate of the data packets exceeds a predetermined value, and, subsequently, the reservation demand packet transmission admission probability determined in advance is lowered if the channel occupancy rate of the data packets still exceeds the predetermined value even after the spreading codes assigned to the reservation demand packet transmission were decreased in number.

7. A mobile-radio packet transmission method using the packet transmission method as claimed in claim 3, 4, 5, or 6, wherein a base station measures the channel occupancy rate of the data packet, and determines the reservation demand packet transmission admission probability and a number indicative of how many spreading codes are available for the reservation demand packets.

10

8. The mobile-radio packet transmission method as claimed in claim 7, wherein the base station inserts the number of spreading codes available for the reservation demand packets and the reservation demand packet transmission admission probability into an information channel of a downlink by time-sharing.

9. A single carrier/DS-CDMA packet transmission method that expands a bandwidth of information symbols by a sequence of spreading codes, and transmits packets by use of spreading signals having an expanded bandwidth, comprising utilizing a short repetition period spreading code when expanding a bandwidth of reservation demand packets and data packets.

10. A single carrier/DS-CDMA packet transmission method that expands a bandwidth of information symbols by a sequence of spreading codes, and transmits packets by use of spreading signals having an expanded bandwidth, comprising:
utilizing a short repetition period

utilizing a long repetition period
spreading code when expanding a bandwidth of data
5 packets.

12. A single carrier/DS-CDMA packet transmission system having a base station and a plurality of mobile stations, wherein
the base station assigns k ($0 < k < n$) spreading codes of a total of N spreading codes to reservation demand packet transmission, and notifies a mobile station of an assigned reservation demand packet channel, and
the mobile station transmits a reservation demand packet using the assigned spreading codes.

13. A single carrier/DS-SS packet
30 transmission system comprising a base station and a
plurality of mobile stations, wherein the base
station comprises:
measurement means which measures a channel

means which determines a reservation demand packet transmission admission probability and a number indicative of how many spreading codes are available for reservation demand packets, and notifies the mobile station thereof,

15

25

30

said mobile station requiring said base

station to assign time slots and spreading codes by transmitting a reservation demand packet as preparation for packet transmission,

5 said base station assigning time slots and spreading codes to the mobile station that demanded, and

 said mobile station spreading the packet by the assigned spreading codes and transmitting the packet via the time slots assigned by said base station.

16. The uplink packet transmission method as claimed in claim 14, wherein said mobile station makes random access to one of time slots of the communication channels to transmit a packet, without requiring the base station to assign time slots.

17. The uplink packet transmission method as claimed in claim 14, wherein said mobile station changes transmission speed of the mobile station according to a transmission volume of a packet that the mobile station is to transmit.

18. The uplink packet transmission method as claimed in claim 15,

 said base station assigning k_1 (k_1 being a natural number, and $k_1 \leq F_n$) time slots for the reservation demand packet transmission, and further assigning m_1 (m_1 being a natural number, $m_1 \leq$ a total number of available spreading codes) spreading codes for spreading the reservation demand packet, and

 said mobile station spreading and

5 19. The uplink packet transmission method
as claimed in claim 18, wherein said base station
changes the number k1 of the time slots for the
reservation demand packet transmission according to
the number of reservation demand packets sent from
10 the mobile station during a predetermined period.

21. The uplink packet transmission method
as claimed in claim 18, wherein said base station
changes the number k1 of the time slots for the
reservation demand packet transmission and the
number m1 of the spreading codes for the reservation
demand packet transmission according to the number
of reservation demand packets sent from the mobile
station during a predetermined period.

22. The uplink packet transmission method
as claimed in claim 18, wherein the base station
30 notifies the base station of a transmission limit of
the reservation demand packet when numerous
reservation demand packets are received from the
mobile stations during a predetermined period, and

the mobile station transmits the reservation demand packet according to the limit.

23. The uplink packet transmission method
5 as claimed in claim 16, wherein said base station
assigns k_2 (k_2 being a natural number, and $k_2 \leq F_n$)
time slots as usable for packet transmission through
random accessing by the mobile station, and further
assigns m_2 (m_2 being a natural number, and $m_2 \leq a$
10 total number of available spreading codes) spreading
codes for spreading a random access packet, and
wherein the mobile station spreads a random access
packet by one of the assigned spreading codes and
transmits the packet in the assigned time slots.

15
24. The uplink packet transmission method
as claimed in claim 23, wherein the base station
changes the number k_2 of the time slots for the
random access packet transmission according to the
20 number of random access packets sent from the mobile
station during a predetermined period.

25. The uplink packet transmission method
as claimed in claim 23, wherein the base station
25 changes the number m_2 of the spreading codes for the
random access packet transmission according to the
number of random access packets sent from the mobile
station during a predetermined period.

30
26. The uplink packet transmission method
as claimed in claim 23, wherein the base station
changes the number k_2 of the time slots for the
random access packet transmission and the number m_2

of the spreading codes for the random access packet transmission according to the number of random access packets sent from the mobile station during a predetermined period.

5

27. The uplink packet transmission method as claimed in claim 10, wherein the base station notifies the base station of a transmission limit of random access packets when numerous random access packets are received from the mobile stations during a predetermined period, and the mobile station makes random accesses according to the limit.

28. The uplink packet transmission method as claimed in claim 17, wherein the base station assigns p spreading codes (p being a natural number, and $p \leq$ a total number of available spreading codes) to the mobile station according to a transmission volume of the mobile station.

20

29. The uplink packet transmission method as claimed in claim 17, wherein the base station assigns to the mobile station a spreading code having a spreading factor that varies according to a transmission volume of the mobile station.

30 The uplink packet transmission method as claimed in claim 17, wherein the base station assigns q time slots (q being a natural number, and $q \leq F_n$) to the mobile station according to a transmission volume of the mobile station.

30

31. The uplink packet transmission method

201010 25292660

as claimed in claim 17, wherein the base station performs assigning by changing at least two of a number p of spreading codes (p being a natural number, and $p \leq$ a total number of available
5 spreading codes), spreading codes having different spreading factors, and a number q of time slots q (q being a natural number and $q \leq F_n$) according to a transmission volume of the mobile station.

10 32. A downlink channel structure in a multi-carrier/DS-CDMA mobile communication system that expands a bandwidth of information symbols by a sequence of spreading codes and transmits spreading information signal obtained by the bandwidth
15 expansion by using a plurality of subcarriers having predetermined frequency intervals, wherein

a plurality of communication channels assigned to the respective subcarriers are divided into predetermined time frames and multiplexed, and
20 the plurality of communication channels assigned to the respective subcarriers are configured to include a common-control channel shared by a plurality of users and communication channels specific to the respective users.

25 33. The downlink channel structure in the multi-carrier/DS-CDMA mobile communication system as claimed in claim 32, wherein the common-control channel includes information for controlling each
30 user's uplink transmission.

34. The downlink channel structure in the multi-carrier/DS-CDMA mobile communication system as

5 35. The downlink channel structure in the
multi-carrier/DS-CDMA mobile communication system as
claimed in any one of claims 32 through 34, wherein
the common-control channel includes broadcast
information commonly directed to each user.

10 36. The downlink channel structure in the
multi-carrier/DS-CDMA mobile communication system as
claimed in any one of claims 32 through 35, wherein
the common-control channel includes a pilot symbol
15 used for demodulating a received signal by each user.

20 37. The downlink channel structure in the
multi-carrier/DS-CDMA mobile communication system as
claimed in any one of claims 32 through 36, wherein
the common-control channel is assigned to one or
more code channels in part or all of the subcarriers.

25 38. The downlink channel structure in the
multi-carrier/DS-CDMA mobile communication system as
claimed in any one of claims 32 through 37, wherein
the common-control channel includes different kinds
of information for different subcarriers.

30 39. The downlink channel structure in the
multi-carrier/DS-CDMA mobile communication system as
claimed in any one of claims 32 through 38, wherein
information included in the common-control channel
assigned to each subcarrier is time-multiplexed to

1. Mr. J. H. Smith
 2. of the
 3. City of New York
 4. is
 5. the
 6. author
 7. of
 8. the
 9. book
 10. entitled
 11. "The
 12. History
 13. of
 14. the
 15. City
 16. of
 17. New
 18. York
 19. from
 20. 1624
 21. to
 22. 1898
 23. and
 24. the
 25. growth
 26. of
 27. the
 28. city
 29. and
 30. the
 31. state
 32. of
 33. New
 34. York
 35. from
 36. 1624
 37. to
 38. 1898
 39. and
 40. the
 41. growth
 42. of
 43. the
 44. city
 45. and
 46. the
 47. state
 48. of
 49. New
 50. York
 51. from
 52. 1624
 53. to
 54. 1898
 55. and
 56. the
 57. growth
 58. of
 59. the
 60. city
 61. and
 62. the
 63. state
 64. of
 65. New
 66. York
 67. from
 68. 1624
 69. to
 70. 1898
 71. and
 72. the
 73. growth
 74. of
 75. the
 76. city
 77. and
 78. the
 79. state
 80. of
 81. New
 82. York
 83. from
 84. 1624
 85. to
 86. 1898
 87. and
 88. the
 89. growth
 90. of
 91. the
 92. city
 93. and
 94. the
 95. state
 96. of
 97. New
 98. York
 99. from
 100. 1624
 101. to
 102. 1898
 103. and
 104. the
 105. growth
 106. of
 107. the
 108. city
 109. and
 110. the
 111. state
 112. of
 113. New
 114. York
 115. from
 116. 1624
 117. to
 118. 1898
 119. and
 120. the
 121. growth
 122. of
 123. the
 124. city
 125. and
 126. the
 127. state
 128. of
 129. New
 130. York
 131. from
 132. 1624
 133. to
 134. 1898
 135. and
 136. the
 137. growth
 138. of
 139. the
 140. city
 141. and
 142. the
 143. state
 144. of
 145. New
 146. York
 147. from
 148. 1624
 149. to
 150. 1898
 151. and
 152. the
 153. growth
 154. of
 155. the
 156. city
 157. and
 158. the
 159. state
 160. of
 161. New
 162. York
 163. from
 164. 1624
 165. to
 166. 1898
 167. and
 168. the
 169. growth
 170. of
 171. the
 172. city
 173. and
 174. the
 175. state
 176. of
 177. New
 178. York
 179. from
 180. 1624
 181. to
 182. 1898
 183. and
 184. the
 185. growth
 186. of
 187. the
 188. city
 189. and
 190. the
 191. state
 192. of
 193. New
 194. York
 195. from
 196. 1624
 197. to
 198. 1898
 199. and
 200. the
 201. growth
 202. of
 203. the
 204. city
 205. and
 206. the
 207. state
 208. of
 209. New
 210. York
 211. from
 212. 1624
 213. to
 214. 1898
 215. and
 216. the
 217. growth
 218. of
 219. the
 220. city
 221. and
 222. the
 223. state
 224. of
 225. New
 226. York
 227. from
 228. 1624
 229. to
 230. 1898
 231. and
 232. the
 233. growth
 234. of
 235. the
 236. city
 237. and
 238. the
 239. state
 240. of
 241. New
 242. York
 243. from
 244. 1624
 245. to
 246. 1898
 247. and
 248. the
 249. growth
 250. of
 251. the
 252. city
 253. and
 254. the
 255. state
 256. of
 257. New
 25

5

10

15